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EXAMINER
LI, AIMEE J

ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Office Action Summary	Application No.	Applicant(s)
		09/801,843	FUKUDA ET AL.
		Examiner	Art Unit
		Aimee J Li	2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>29 December 2004 and 31 January 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
    closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>50-71</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>50-71</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

3.   Claims 50-71 have been examined. Claims 50, 58, 64, and 70 have been amended as per

Applicant's request.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5.   Claims 50-69 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with

the enablement requirement. The claim(s) contains subject matter which was not described in

the specification in such a way as to enable one skilled in the art to which it pertains, or with

which it is most nearly connected, to make and/or use the invention.

6.   Claims 50-69 are also rejected under 35 U.S.C. 112, first paragraph, as failing to comply

with the written description requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to reasonably convey to one skilled in the relevant

art that the inventor(s), at the time the application was filed, had possession of the claimed

invention.

7.   Independent claim 50 recites the limitation, "wherein the image reader, the image writer,

and the image processing unit are configured as independent, replaceable units". Independent

claim 58 recites the limitation, "wherein the image reader and the image processing unit are

configured as independent, replaceable units". Independent claim 64 recites the limitation,

"wherein the image writer and the image processing unit are configured as independent,

replaceable units". However, the "replaceable" limitation in these claims is not discussed in the

specification. The specification states that units are "structured as independent units" in order to

"easily divide the manufacture" process and "construct a multi-function system at low cost" (see

lines 2-10 on p.86 of the Specification). The specification also eludes the desirability of

replaceable units in order to ease upgrades (see lines 7-16 on p.8 of the Specification), but this is

background information relating to the prior art. Further, the specification discusses "changing"

individual units functions, but does not specify that each individual unit is "replaceable", as

changing could simply be the reprogramming of a unit (see lines 1-23 on p.66 of the

Specification). None of the above portions of the Specification have fully described "replaceable

units" sufficiently to enable one skilled in the art to make or use the invention as claimed without

undue experimentation, nor have they conveyed that the Applicant had possession of the claimed

invention at the time the application was filed. Dependent claims 51-57, 59-63 and 65-69

contain all the limitations of their parent claims, and thus are rejected for the same reasons as

above.

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

9.   Claims 50-53, 55-61, 63-67, and 69 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Read et al., U.S. Patent No. 5,420,809 (herein referred to as Davidson) in view

of Davidson et al., U.S. Patent No. 5,613,157 (herein referred to as Davidson) and in further

view of Debes et al., U.S. Patent Number 5,970,223 (herein referred to as Debes).

10.   In regards to claims 50, 58 and 64, taking claim 50 as exemplary, Read has taught a

multi-function image processing apparatus (see Col.176 lines 38-39 and Col.177 lines 14-16)

comprising:

a.   An image reader (3 of Fig.54) configured to read first image data (see Col.176

lines 62-65),

b.   An image writer (1305 of Fig.54) configured to image data onto a transcription

sheet (see Col.176 lines 58-60),

c.   An image processing unit (71-74 of Fig.2 and 71 of Fig.54) configured to process

the first image data to second image data and transmit the second image data to

the image writer (see Col.176 lines 52-60),

d.   Wherein the image reader, the image writer, and the image processing unit are

configured as independent units (see Fig.54),

e.   The multi-function image processing apparatus is configured to perform both

printing and copying functions (see Col.176 lines 58-60 and Col.177 lines 14-16),

the image reader is configured to read data for copying functions (see Col.176

lines 62-65 and Col.177 lines 14-16), the image processing unit is configured to

perform image processing for both printing and copying functions (see Col.176

lines 52-60 and Col.177 lines 14-25), and the image writer is configured to image

data on the transcription sheet for both printing and copying functions (see

Col.176 lines 52-60 and Col.177 lines 14-25),

f.   At least the image processing unit has a SIMD type processor (see Col.13 lines

41-53) including:

i.   A parallel processing unit (71-74 of Fig.2) configured to perform parallel

        processing jobs using a plurality of arithmetic units configured to perform

        arithmetic processing on image data (see Col.13 lines 41-54),

ii.   A data providing unit (80 of Fig.2) configured to provide data to the

        parallel processing unit (see Col.13 line 54 – Col.14 line 10),

iii.   An instruction providing unit (130 of Fig.3) configured to provide a same

        processing instruction to each of the plurality of arithmetic units (see

        Col.13 lines 41-53 and Col.15 lines 15-30),

iv.   An input unit (130 of Fig.3/31) configured to input an interruption request

        (see Col.105 lines 33-45) to interrupt a first parallel processing job

        performed by the parallel processing unit in favor of a second parallel

        processing job (see Col.105 lines 46-52),

v.   A decision unit (130 of Fig.3/31) configured to determine a priority

        between the first parallel processing job and the second parallel processing

        job (see Col.105 lines 33-52),

vi.   A suspending unit (770 of Fig.31) configured to suspend the first parallel

        processing job when the decision unit determines that the second parallel

        processing job has a higher priority than the first parallel processing job

        (see Col.108 lines 7-22 and Col.109 lines 10-13),

vii.   A control unit (770 of Fig.31) configured to control the data providing unit

        and the instruction providing unit to provide second data to be

        arithmetically processed by the parallel processing unit during the second

parallel processing job in place of first data to be arithmetically processed

by the parallel processing unit during the first parallel processing job, and

to provide a same instruction of said second parallel processing job to each

of the arithmetic units (see Col.108 lines 6-28). Here, an interrupt vector

is loaded and subsequently executed following suspension and saving of

the normal execution.

11.   Read has not explicitly taught wherein the image reader, the image writer, and the image

processing unit are configured as replaceable units. However, Davidson has taught the use of

modular individual units, such as processors and I/O devices, in parallel processors in order to

allow easy upgradeability and easy interconnection due to standard interfaces (see Davidson,

Col.1 lines 14-27). One of ordinary skill in the art would have recognized that it is desirable to

have the ability to upgrade a system without modifying the entire system. Therefore, because the

image reader and image writer of Read are I/O devices, and the image process unit of Read is a

processor, one of ordinary skill in the art would have found it obvious to modify the individual

units of Read in the manner of Davidson to be modular units, so as to provide superior upgrade

capabilities and easy interconnection to other modules.

12.   In addition, Read has not explicitly taught interrupting a first parallel processing job and

a second parallel processing job when said first parallel processing job comprising a printing,

copying, or facsimile job and said second parallel processing job comprising a printing, copying

or facsimile job. Debes has taught that the processing jobs, original and interrupted jobs, are

both printing, copying, or facsimile jobs (Debes column 1, lines 6-26; column 4, lines 12-41;

column 17, lines 42-59; Figure 9; and Figure 10). A person of ordinary skill in the art at the time

the invention was made would have recognized that the interrupting a first job with a second job allows priority or more urgent printing, copying, or facsimile jobs to execute first before a less urgent job that was issued first. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the priority system of Debes in the device of Read to allow more urgent jobs to complete first.

13.　　Claims 58 and 64 are nearly identical to claim 50. Claim 58 differs in its lack of an image writer, and that its claim limitations are comprised within a scanner instead of a multi-function image processing apparatus. However, the multi-function image processing apparatus of Read in view of Davidson also comprises a scanner (see Read, Col.176 lines 61-65). Claim 64 differs in its lack of an image reader, and that its claim limitations are comprised within a printer instead of a multi-function image processing apparatus. However, the multi-function image processing apparatus of Read in view of Davidson also comprises a printer (see Read, Col.176 lines 58-60). Therefore, claims 58 and 64 are rejected for the same reasons as claim 50.

14.　　In regards to claims 51, 59 and 65, taking claim 51 as exemplary, Read in view of Davidson has taught the multi-function image processing apparatus according to claim 50, further comprising an instruction storing unit (see Read, 21 of Fig.54) configured to store instructions.

15.　　Claims 59 and 65 are nearly identical to claim 51. Claims 59 and 65 differ in their parent claims, but encompass the same scope as claim 51. Therefore, claims 59 and 65 are rejected for the same reasons as claim 51.

16.   In regards to claims 52, 60 and 66, taking claim 52 as exemplary, Read in view of

Davidson has taught the multi-function image processing apparatus according to claim 50,

further comprising:

a.   A storing unit (see Read, 770 of Fig.31) configured to store suspension

information consisting of data and an instruction at a point of time when a parallel

processing has been suspended by the suspending unit (see Read, Col.109 lines 4-

22),

b.   A detecting unit (see Read, 770 of Fig.31) configured to detect whether

interruption processing has finished or not (see Read, Col.109 lines 23-25). Here,

the interrupt pseudo-instruction unit inherently detects that the interruption

processing has finished so that normal processing can be resumed.

c.   A transmission unit (see Read, 770 of Fig.31) configured to transmit the

suspension information stored by the storing unit to an original position when the

detecting unit has detected a finish of the interruption processing (see Read,

Col.109 lines 23-30).

17.   Claims 60 and 66 are nearly identical to claim 52. Claims 60 and 66 differ in their parent

claims, but encompass the same scope as claim 52. Therefore, claims 60 and 66 are rejected for

the same reasons as claim 52.

18.   In regards to claims 53, 61 and 67, taking claim 53 as exemplary, Read in view of

Davidson has taught the multi-function image processing apparatus according to claim 51,

further comprising:

a.   A program counter (see Read, 701 of Fig.31),

      b.   An accumulator (see Read, 200 of Fig.3/5),

      c.   Wherein the program counter assigns an instruction stored by the instruction

storing unit (see Read, Col.15 lines 47-53 and Col.94 lines 36-39), and each

arithmetic unit carries out the arithmetic processing using the accumulator (see

Read, Fig.5, Col.18 lines 18-49 and Col.25 lines 8-34).

19.   Claims 61 and 67 are nearly identical to claim 53. Claims 61 and 67 differ in their parent

claims, but encompass the same scope as claim 53. Therefore, claims 61 and 67 are rejected for

the same reasons as claim 53.

20.   In regards to claims 55, 63 and 69, taking claim 55 as exemplary, Read in view of

Davidson has taught the multi-function image processing apparatus according to claim 52,

wherein the storing unit stores various parameter data that are necessary for the arithmetic

processing carried out by the arithmetic units (see Read, Col.108 lines 7-22 and Col.109 lines 10-

30). Here, the interrupt control registers and the current PC value are saved, all of which are

required to process subsequent instructions.

21.   Claims 63 and 69 are nearly identical to claim 55. Claims 63 and 69 differ in their parent

claims, but encompass the same scope as claim 55. Therefore, claims 63 and 69 are rejected for

the same reasons as claim 55.

22.   In regards to claim 56, Read in view of Davidson has taught the multi-function image

processing apparatus recited in claim 50, further comprising a facsimile control unit (see Read, 4

of Fig.54) configured to transmit the first data read by the image reader as a facsimile image and

receive facsimile image data (see Read, Col.176 line 61 Col.177 line 13).

23.   In regards to claim 57, Read in view of Davidson has taught the multi-function image processing apparatus recited in claim 56, wherein the image processing unit is configured to process the facsimile image data to third data and transmit the third data to the image writer, and the image writer is configured to image the third data onto the transcription sheet (see Read, Col.176 line 38 – Col.177 line 13).

24.   Claims 54, 62 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Read et al., U.S. Patent No. 5,420,809, in view of Davidson et al., U.S. Patent No. 5,613,157 in further view of Debes et al., U.S. Patent Number 5,970,223, as applied to claim 53 above, and further in view of Short, *Embedded Microprocessor Systems Design: An Introduction Using the Intel 80C188EB*.

25.   In regards to claims 54, 62 and 68, taking claim 54 as exemplary, Read in view of Davidson has taught the multi-function image processing apparatus according to claim 52, further comprising:

    a.   A program counter (see Read, 701 of Fig.31),

    b.   An accumulator (see Read, 200 of Fig.3/5),

    c.   A first register (see Read, 706/707 of Fig.31),

    d.   A data register configured to store data provided by the data providing unit (see Read, 200 of Fig.3/5),

    e.   Wherein the suspension information consists of a program counter value and the first register at a point of time when a parallel processing has been suspended by the suspending unit (see Read, Col.108 lines 7-22 and Col.109 lines 10-30).

26.   Read in view of Davidson have not explicitly taught wherein the suspension information

further consists of the contents of the accumulator and data stored in the data register.

27.   However, Short has taught that when executing a context switch due to an interrupt that

all information needed to correctly resume the task's execution following the interrupt must be

saved, including registers (see Short, p.468-469). Because both the accumulator and the data

register are registers (see Read, 200 of Fig.3/5), one of ordinary skill in the art would have found

it obvious to modify the processor of Morton to further save the accumulator register and other

data registers upon an interrupt so that the task's execution could be completely and correctly

returned to following the interrupt service routine's processing.

28.   Claims 62 and 68 are nearly identical to claim 54. Claims 62 and 68 differ in their parent

claims, but encompass the same scope as claim 54. Therefore, claims 62 and 68 are rejected for

the same reasons as claim 54.

29.   Claims 70-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Read et al.,

U.S. Patent No. 5,420,809 (herein referred to as Davidson) in view of Debes et al., U.S. Patent

Number 5,970,223 (herein referred to as Debes).

30.   In regards to claim 70, Read has taught a multi-function image processing apparatus

(Read Col.176 lines 38-39 and Col.177 lines 14-16) comprising:

      a.   An image reader (Read 3 of Fig.54) configured to read first image data, said

          image reader including at least one processor (Read Col.176 lines 62-65),

      b.   An image writer (Read 1305 of Fig.54) configured to image data onto a

          transcription sheet, said image writer including at least one processor (Read

          Col.176 lines 58-60),

c.   An image-processing unit (Read 71-74 of Fig.2 and 71 of Fig.54) configured to

process the first image data to second image data and transmit the second image

data to the image writer, said image processing unit including at least one

processor (Read Col.176 lines 52-60),

d.   A facsimile control unit (Read 4 of Fig.54) configured to transmit the first data

read by the image reader as a facsimile image and receive facsimile image data,

said facsimile control unit including at least one processor (Read Col.176 line 61

Col.177 line 13),

e.   Wherein said multi-function image processing apparatus is configured to operate

a first parallel processing job comprising a printing, copying, or facsimile job and

a second parallel processing job comprising a printing, copying, or facsimile job

by having a processor of one of said image reader, said image write, said image

processing unit, and said facsimile control unit operating said first parallel job and

a processor of said image reader, said image writer, said image processing unit,

and said facsimile control unit operating said second parallel job, said first and

said second parallel processing jobs operating on processors of different ones of

said image reader, said image writer, said image processing unit, and said

facsimile control unit at a same time (Read Col.13 lines 12-23, 41-54), said

printing job operated by the image processing unit then the image writer, said

copying job is operated by the image reader, then the image processing unit, then

the image writer, an incoming facsimile job is operated by the facsimile control

unit, then the image processing unit, then the image writer, and an outgoing

facsimile job is operated by the image reading unit, then the image processing

unit, then the facsimile control unit, the image reader is configured to read data

for copying and facsimile functions (Read Col.176 lines 62-65 and Col.177 lines

14-16), the image processing unit is configured to perform the image processing

for printing, copying, and facsimile functions (Read Col.176 line 52 - Col.177 line

25), and the image writer is configured to image data on the transcription sheet for

printing, copying, and facsimile functions (Read Col.176 line 52 - Col.177 line

25),

f.   Said at least one processor of the image processing unit includes a SIMD type

processor (Read Col.13 lines 41-53) including:

    i.   A parallel processing unit (Read 71-74 of Fig.2) configured to perform

parallel processing jobs using a plurality of arithmetic units configured to

perform arithmetic processing on image data (Read Col.13 lines 41-54),

    ii.   A data providing unit (Read 80 of Fig.2) configured to provide data to the

parallel processing unit (Read Col.13 line 54 – Col.14 line 10),

    iii.   An instruction providing unit (Read 130 of Fig.3) configured to provide a

same processing instruction to each of the plurality of arithmetic units

(Read Col.13 lines 41-53 and Col.15 lines 15-30),

    iv.   A decision unit (Read 130·of Fig.3/31) configured to determine a priority

between the first parallel processing job and the second parallel processing

job (Read Col.105 lines 33-52),

      v.   A suspending unit (Read 770 of Fig.31) configured to suspend the first

parallel processing job when the decision unit determines that the second

parallel processing job has a higher priority than the first parallel

processing job (Read Col.108 lines 7-22 and Col.109 lines 10-13),

      vi.   A control unit (Read 770 of Fig.31) configured to control the data

providing unit and the instruction providing unit to provide second data to

be arithmetically processed by the parallel processing unit during the

second parallel processing job in place of first data to be arithmetically

processed by the parallel processing unit during the first parallel

processing job, and to provide a same second parallel processing job

instruction to each of the arithmetic units (Read Col.108 lines 6-28).

Here, an interrupt vector is loaded and subsequently executed following

suspension and saving of the normal execution.

31.   Read has not explicitly taught an input unit configured to input an interruption request to

interrupt said first parallel processing job performed by the parallel processing unit in favor of

said second parallel processing job, when the two jobs are printing, copying, or facsimile jobs.

However, Read has taught an input unit (Read 130 of Fig.3/31) configured to input an

interruption request (Read Col.105 lines 33-45) to interrupt a first general parallel processing job

performed by the parallel processing unit in favor of a second general parallel processing job

(Read Col.105 lines 46-52). Debes has taught that the processing jobs are both printing,

copying, or facsimile jobs (Debes column 1, lines 6-26; column 4, lines 12-41; column 17, lines

42-59; Figure 9; and Figure 10). A person of ordinary skill in the art at the time the invention

was made would have recognized that the interrupting a first job with a second job allows

priority or more urgent printing, copying, or facsimile jobs to execute first before a less urgent

job that was issued first. Therefore, it would have been obvious to a person of ordinary skill in

the art at the time the invention was made to incorporate the priority system of Debes in the

device of Read to allow more urgent jobs to complete first.

32.   In regards to claim 71, Read has taught the multi-function image processing apparatus

according to claim 70, further comprising a system controller (Read 60 of Fig.2) and a process

controller (Read 71 of Fig.2) configured to allocate usage of the image reader, the image writer,

and the image processing unit among the plurality of jobs operating in parallel (Read Col.12

lines 54-62, Col.13 lines 41-53 and Col.14 lines 27-39).

Response to Arguments

33.   Applicant's arguments filed 31 December 2004 and 31 January 2005 with regards to the

35 USC § 112, first paragraph have been fully considered but they are not persuasive. Applicant

argues in essence on page 14 "...it is respectfully submitted that one having ordinary skill in the

art could make or use the inventions recited in Claims 50-69." This has not been found

persuasive. The language focused on by the 35 USC §112, first paragraph lack of enablement

rejection was "replaceable units". Applicants' application recites the language "changeable" not

"replaceable". The two words have different connotations within the art. For example,

"changeable" could just mean a device whose program, which might, for example, control the

priorities of the instructions, can be changed. The term "replaceable" however means that the

unit can be substituted by another unit. This has not been enabled. The Examiner could not

locate in the specification a description of how the image reader, image writer, and the image processing unit can be substituted for another unit.

34.   Applicant's arguments with respect to claims 50-71 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

35.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aimee J Li whose telephone number is (571) 272-4169. The examiner can normally be reached on M-T 7:30am-5:00pm.

36.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

37.   Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJL
Aimee J. Li
18 April 2005
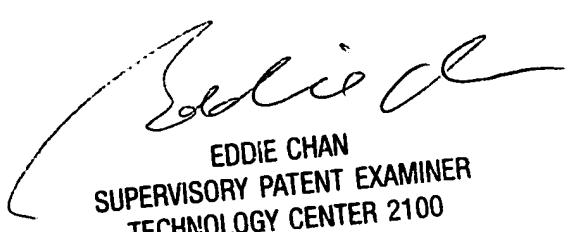
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